3.0 ALTERNATIVES AND CUMULATIVE PROJECTS

3.1 FACTORS USED IN SELECTION OF ALTERNATIVES

3.1.1 Alternatives Development and Screening Process

One of the most important aspects of the environmental review process is identifying and assessing reasonable alternatives that can potentially avoid or minimize the impacts of a proposed project. In addition to mandating consideration of the No Project Alternative, the California Environmental Quality Act (CEQA) Guidelines (Section 15126.6[d]) emphasize the selection of a range of reasonable alternatives and an adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision makers.

The CEQA requires consideration of a range of reasonable alternatives to the Project or Project location that (1) could feasibly attain most of the basic Project objectives and (2) would avoid or substantially lessen any of the significant impacts of the proposed Project. An alternative cannot be eliminated simply because it is more costly or if it could impede the attainment of all Project objectives to some degree. However, the CEQA Guidelines declare that an Environmental Impact Report (EIR) need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote or speculative. The CEQA requires that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project.

The CEQA Guidelines require the selection of an environmentally superior alternative. The determination of an environmentally superior alternative is based on the consideration of how the alternative fulfills the project objectives and how the alternative either reduces significant, unavoidable impacts or substantially reduces the impacts to the surrounding environment. The CEQA Guidelines (Section 15126.6(e)(2)) state, in part, that “if the environmentally superior alternative is the ‘No Project’ alternative, the EIR would also identify an environmentally superior alternative among the other alternatives.”

This screening analysis does not focus on relative economic factors of the alternatives but will consider them as long as they are feasible, since the CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may “impede to some degree the attainment of Project objectives or would be more costly.” However, feasible means capable of being

accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (CEQA Guidelines Section 15364). Therefore, economic considerations play a factor in the determination of whether and alternative is "feasible" or "infeasible." The question of market demand or Project need is not considered.

3.1.2 Alternatives Screening Methodology

Alternatives to the proposed Project were selected based on input from Chevron Products Company (Chevron), the EIR study team, and the public and local jurisdictions during EIR scoping hearings. The alternatives screening process was three steps:

Step 1: Define the alternatives to allow comparative evaluation.

Step 2: Evaluate each alternative in consideration of one or more of these criteria:

- The extent to which the alternative would accomplish most of the basic goals and objectives of the Project;
- The extent to which the alternative would avoid or lessen one or more of the identified significant environmental effects of the Project;
- The potential feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, General Plan consistency, and consistency with other applicable plans and regulatory limitations; and
- The requirement of the CEQA Guidelines to consider a No Project Alternative and to identify, under specific criteria, an "environmentally superior" alternative in addition to the No Project Alternative (Section 15126.6(e)).

Step 3: Screen the alternative based on the suitability of the proposed alternative for full analysis in the EIR. If the alternative is unsuitable based on Step 2, eliminate it from further consideration with appropriate justification.

Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts and infeasible alternatives were removed from further analysis. In the final phase of the screening analysis, the environmental advantages and disadvantages of the remaining alternatives were carefully weighed with respect to potential for overall environmental advantage, technical feasibility, and consistency with Project and public objectives.

If an alternative clearly does not provide any environmental advantages compared to the proposed Project, it is eliminated from further consideration. At the screening stage, it is not possible to evaluate potential impacts of the alternatives or the proposed Project with absolute certainty. However, it is possible to identify elements of the proposed Project that are likely to be the sources of impact. A preliminary assessment of potential significant effects of the proposed Project (see Appendix B, Notice of Preparation) by the California State Lands Commission (CSLC), acting as Lead Agency under CEQA, identified the following impacts:

- There is a reasonable possibility that operation of the Marine Terminal offshore loading facilities during the 30-year lease period will cause an oil spill;
- Such an oil spill could significantly affect the physical and biological environments; and
- Other aspects of the proposed Project's operations could also significantly affect the environment.

The Notice of Preparation also proposed significance criteria that could be applied to each impact area; these criteria are based on previous analyses of marine terminals and offshore loading facilities for which the CSLC was the Lead Agency. For the screening analysis, the technical and regulatory feasibility of various potential alternatives was assessed at a general level; specific feasibility analyses are not necessary for this purpose. Feasibility was assessed using reverse reason; that is, an attempt was made to identify anything about the alternative that would be infeasible on technical or regulatory grounds. The CEQA does not require elimination of a potential alternative based on costs of construction, operation, and maintenance; however, alternatives may be rejected because they are infeasible (Section 15126.6(a)). For the proposed Project, issues that make certain alternatives infeasible or otherwise inappropriate for further evaluation relate to:

- Inability to reduce significant impacts of the Project;
- Failure to meet most of the basic project objectives (CEQA Guidelines Section 15126.6[c]);
- Introduction of features that would make terminal operation unsafe;
- Institutional approval factors that would greatly delay execution of the lease;
- Berth configurations that render operations impractical;

- Similarity with alternatives that are analyzed in detail; and
- Technical limitations on constructing or developing the alternative.

3.1.3 Summary of Pipelines

Several of the alternatives discussed in this section involve using existing pipelines. Therefore, the following information regarding existing pipelines in southern California provides a foundation for the alternatives.

Several pipelines in the Los Angeles basin transport crude and other raw materials to the Chevron El Segundo Refinery and other area refineries. Existing pipelines include Line 63, Line 2000 – Pacific Pipeline, Line 93, and the Edison Pipeline Terminal Company (EPTC) Line. Most of these existing non-Chevron pipelines are in operation and currently transporting products.

In addition, there are four eight-inch (20.3-centimeter [cm]) Chevron pipelines that connect the Chevron El Segundo Refinery to San Pedro (to the east of the Port of Los Angeles [POLA]). Only two of them have preserved integrity to the Navy fuel depot, near the intersection of Anaheim Boulevard and Gaffey Street, approximately one mile (1.6 kilometers [km]) north of the POLA. Of those two pipelines, one is part of another proposed Project by Chevron and one ends near the intersection of Anaheim Boulevard and Gaffey Street. The other two have been cut, capped, and modified in multiple locations, leaving only one potential existing Chevron pipeline available. According to Chevron, this pipeline could transport a maximum of approximately 30,000 barrels per day (bpd).

The pipelines are summarized in Table 3-1. Some of the pipelines would require substantial modifications and potential displacement of current throughput in order to utilize the pipelines for a connection to the POLA/Port of Long Beach (POLB). However, the Chevron pipeline and the EPTC pipeline could provide some capacity, approximately 50,000 bpd, with some modifications.

Table 3-1
Pipelines that Could Service the El Segundo Refinery

Pipeline	Size, inches diameter	Capacity, thousand barrels per day	Current Available Capacity, thousand barrels per day	Notes
Line 63	14-16	95	35	Only carries oil within the Los Angeles Basin. Connects most area refineries, including El Segundo. Pier 400 connection would displace current material. Portions of the line would need to be reversed. A connection to Pier 400 would be made from Valero as part of the Pier 400 project.
Line 2000	16-20	130	80	Carries oil from San Joaquin Valley to Los Angeles Basin. A connection at Lynwood delivers oil to El Segundo to the west and Valero Refinery to the south. Connecting to Pier 400 would require reversing the portion of the line between Lynwood and Valero. The Pier 400 project would connect to Valero.
Line 93	16	95	75	Carries oil from San Joaquin Valley to Los Angeles Basin. Would require approximately four miles (6.4 km) of new pipeline. In addition, the current 75,000 bpd would be displaced
Edison Pipeline Terminal Company	12-16	100	20	Runs from El Segundo Refinery to the POLB. A connection to the POLB would need to be constructed for access to Pier 400.
Chevron 1 & 2	8	60	30	Runs from El Segundo Refinery to the Navy Depot near the POLA. Would require a new pipeline from Navy Depot to POLA (estimated 0.5 miles [0.8 km]).
Chevron 3 & 4	8	0	0	Pipelines have been abandoned.

Source: Chevron 2009

3.1.4 Summary of Screening Results

Potential alternatives were reviewed against the list of infeasibility factors and a number of alternatives were eliminated based on those criteria. Those alternatives found technically feasible and consistent with the Applicant's objectives were reviewed to determine if the alternative had the potential to reduce the environmental impacts of the proposed Chevron El Segundo Marine Terminal Lease Renewal Project (Project).

Table 3-2 shows the outcome of the evaluation and selection of potential alternatives to be addressed in the EIR. Those alternatives in the first column are eliminated from further consideration (see rationale in Section 3.2, Alternatives Eliminated from Full

Evaluation), and those in the second column are described in detail in Section 3.3, Alternatives Evaluated in EIR, and evaluated in Section 4.0, Environmental Analysis.

Table 3-2
Evaluation and Selection of Potential Alternatives

Alternatives Eliminated from Consideration	Alternatives Evaluated in this EIR
Move CBM into Federal Waters	
Install SPM in Federal Waters	No Project Alternative
Combine Two Berths into One	CBM Relocation in State Waters for Crude Only
Open Access Alternative	SPM Replacement in State Waters for Crude Only
Consolidation with Other Terminals	VLCC Use of Pier 400
Limitations on Terminal Use	

Notes: CBM = Conventional Buoy Mooring; SPM = Single Point Mooring, VLCC = Very Large Crude Carrier

3.2 ALTERNATIVES ELIMINATED FROM FULL EVALUATION

3.2.1 Move CBM into Federal Waters

This alternative would relocate the existing conventional buoy mooring (CBM) farther offshore into Federal waters. The existing sub-sea pipelines would be replaced with larger pipelines or onshore pumping facilities would be replaced with greater pumping capacity. The underwater pipelines may require insulation to protect viscous products and waxy crudes handled by the Marine Terminal.

This arrangement would increase air emissions from increased pumping requirements, increase the risk of spills from longer pipelines, and would provide no additional benefits over the relocation of a berth into State waters (see Section 3.3, Alternatives Evaluated in EIR). In addition, placing the facility in Federal waters would involve Federal agencies and require additional assessment and permitting activities that could take several years, further delaying the execution of the lease, with no increased environmental benefit. Therefore, this alternative is eliminated from further consideration in the EIR.

3.2.2 Install SPM into Federal Waters

This alternative entails installing two single point moorings (SPM) farther offshore in Federal waters and either replacing the existing sub-sea pipelines with larger pipelines or replacing onshore pumping facilities.

These changes would increase the risk of spills and air quality impacts similar to those associated with relocating the CBM to Federal waters and would provide no additional

benefits over the relocation of a berth in State waters (see Section 3.3, Alternatives Evaluated in EIR). This alternative would further delay the execution of the lease, with no increased environmental benefit. In addition, placing the facility in Federal waters would involve Federal agencies and require additional assessment and permitting activities that could take several years. Therefore, this alternative is eliminated from further consideration in the EIR.

3.2.3 Combine Two Berths into One

This alternative would combine the two existing berths, Berths 3 and 4, into one operable berth that could satisfy unloading crude oil for the Refinery and loading product from the Refinery as necessary.

Combining two berths into one would be operationally difficult. As discussed in Section 2.0, Project Description, current occupancy rates are high at the two existing berths. A combined berth would service the same throughput and number of vessels, which would create logistical problems loading product and unloading crude from the same berth and would not provide any environmental benefits over the proposed Project. This alternative would likely cause ships to remain in the harbor for an increased time while waiting to use the berth, and therefore, increase air emissions. Therefore, this alternative is eliminated from further consideration in the EIR.

3.2.4 Open Access Alternative

Under this alternative, the Marine Terminal would continue to operate; however, the facilities would be required to accommodate vessels with products destined to or from several other oil companies in addition to Chevron.

The use of the terminal by additional ships would increase delays in shipments for both Chevron and the other oil companies; it would also be logistically impractical and idling vessels would increase air emissions. This alternative would also require constructing several pipelines to transport oil from the Marine Terminal's onshore facilities to the respective oil company refineries; this construction would increase hazards associated with increased pipelines and impacts on air and water quality, safety, and land use. Local refineries are southeast of the Marine Terminal within the cities of Torrance, Carson, and Wilmington. Although some existing pipelines could transport some of the product, additional pipelines and modifications to existing infrastructure extending from the facilities in El Segundo to these locations would be required. The feasibility of permitting these pipelines is speculative, and approval by the various jurisdictions

involved may not occur for many years. Open access would likely increase vessel traffic at the Marine Terminal, which would provide no apparent environmental benefit. Increased traffic to the Marine Terminal would also proportionally reduce marine traffic to other terminals with potential environmental benefits in those areas translated into potential impacts at the Marine Terminal. In final analysis, this alternative is infeasible and eliminated from further review.

3.2.5 Consolidation with Other Terminals

Under this alternative, loading and unloading operations would be consolidated with other terminals in the vicinity. The nearest terminals, more than 15 miles (21 km) from the Marine Terminal in the POLA and POLB, are operated by various companies, including Shell, Mobil, GATX, and ConocoPhillips.

According to the California Energy Commission (CEC), although there is some spare incremental crude oil import capability for marine berths in the San Pedro Harbor, it is unlikely that these facilities could operate at theoretic maximum throughput levels due to operational limitations of inadequate shore-side storage tank capacities, permit limits on throughput of terminals, lack of pipeline interconnections with multiple refineries, and lack of compliance with Marine Oil Terminal Engineering and Maintenance Standards for some crude oil import terminals (CEC 2008). In addition, operating private marine oil import terminals in a purely cooperative and coordinated manner is unlikely due to the competitive nature of the petroleum industry and potential anti-trust regulatory concerns.

Transporting Refinery products by pipeline, with high flammability potential, would introduce safety issues as pipelines pass through populated areas. Other refineries do not import the same quantity and types of crude oil and products that Chevron requires at its Refinery, which may necessitate additional pumps, pipelines, and a separate distribution system from the ports of entry beyond those currently used by other refineries. The ability of other refineries to add such systems is speculative. Therefore, consolidation of these terminals is considered infeasible and eliminated from further review as an alternative.

3.2.6 Limitations on Terminal Use

Scenarios under this alternative limit the Marine Terminal's import or export operations. These scenarios include allowance for crude import only, product export only, or emergency use only.

Crude Import Only Through Marine Terminal

Under this alternative, the Marine Terminal would import only crude oil. Products would be transported through another marine terminal via a pipeline connected to the Refinery. It is possible that existing pipelines could be used for this purpose.

This alternative would decrease the risk of product spills at the Marine Terminal since no products would be transported through the Marine Terminal. This risk would be shifted to vessels calling at the POLA and POLB. However, the biological impacts of a spill at the POLA/POLB would be less than the impacts of a spill at the Terminal because of enclosed loading areas and ease of containment within the POLA/POLB. Whereas a spill at the POLA/POLB could easily be contained, a spill at the Marine Terminal would be in open water and would impact sensitive areas around Santa Monica Bay. Spills within the ports would still be significant, but they would be potentially less severe. However, the risks associated with vessel traffic and terminal approach would be the same.

In addition, some vessels that currently call at the Marine Terminal also export product and import crude. Under this alternative, these tankers would call at a second terminal to load exported products; the second docking operation, including maneuvering to another terminal, loading product, and hoteling at berth, would increase air emissions and slightly increase the risk of spills. Also, transporting Refinery products, with low vapor pressures and high flammability potential, could introduce safety issues where pipelines pass through populated areas, producing some risk and environmental justice impacts. Since this alternative would increase safety risks of product transport in populated areas, it is eliminated from further consideration in the EIR.

Product Export Only Through Marine Terminal

Under this alternative, the Marine Terminal would only export product. Without the ability to import crude through the terminal, the Refinery would necessarily obtain crude oil from the POLA/POLB terminals via pipeline or from existing offshore fields via pipeline and railroad. It is possible that existing pipelines could transport crude oil from the ports. However, these pipelines would likely require modification to handle heavier crudes. This alternative would decrease the risk of crude spills at the Marine Terminal, since no crude would be transported through the Marine Terminal. This risk would be shifted to vessels calling at the POLA/POLB, with a similar reduction in spill impacts as previously discussed.

This alternative would decrease the risk of crude spills at the Marine Terminal. However, this risk would be shifted to vessels calling at the POLA/POLB, where spill impacts would be reduced as previously discussed. Although some existing pipelines could transport some or all of the crude oil, additional pipelines and modifications to existing infrastructure between the ports and the Refinery could be necessary to satisfy large crude throughputs at the Refinery. The feasibility of permitting these pipelines is speculative and approval by relevant jurisdictions could take several years. There would also be an increased hazard associated with transporting petroleum products via pipeline. Also, the types of crude available to the Refinery from the existing terminals in the POLA/POLB are limited. Therefore, this alternative is eliminated from further consideration in the EIR.

Emergency Use Only

Under this alternative scenario, the Marine Terminal facilities and equipment would remain unchanged, but they would be used only in emergencies when other terminals are unavailable or tankers or barges need to unload their contents immediately.

While this alternative would decrease the overall risk of spills at the Marine Terminal, the Refinery would necessarily obtain crude oil from other sources, including other terminals, and from onshore fields via pipeline and railroad. Products would be transported from the Refinery via pipeline, railroad, or truck. Delays associated with pipeline permitting and construction and the safety risks of transporting products through populated areas would be as previously discussed. This alternative is also similar to the No Project Alternative evaluated in Section 3.3, Alternatives Evaluated in EIR. Therefore, this alternative is eliminated from further consideration in the EIR.

3.3 ALTERNATIVES EVALUATED IN EIR

Several feasible alternatives to the proposed Project have been fully considered. In addition, CEQA requires analysis of a No Project Alternative. Detailed discussions of each of these alternatives follow.

3.3.1 No Project Alternative

Under this alternative, CSLC would not grant a new lease and Chevron would cease to operate the Marine Terminal. Chevron would import crude oil and export products through other means, including the POLA/POLB terminals, onshore pipelines, unit trains, trucking, or, most likely, a combination of those means. This could limit the operations of the

Refinery and may reduce the Refinery's throughput, which as noted in Section 1.2.3, Definition of Baseline and Future Conditions, ranges up to 270,000 bpd, 80 percent of which is received through the Marine Terminal. This alternative would decommission the Marine Terminal facilities and abandon components in place or remove them. Utilizing the POLA/POLB terminals would require use and modification of existing pipelines to the POLA/POLB and possible construction of new pipelines to the POLA/POLB.

Abandonment of the Marine Terminal would involve dismantling and removing equipment; excavating and treating soils; and removing piping, tanks, and other structures. This would be analyzed in a separate CEQA document. Heavy equipment including cranes, backhoes, flat bed trucks, dump trucks, and front-end loaders would operate throughout the Marine Terminal site for at least several months. Some facilities would be removed and others would likely be abandoned in place. Trucks would enter and leave the area during the decommissioning.

If the Marine Terminal closed and the Refinery imported crude oil and exported products by connecting to the POLA/POLB through existing pipelines and infrastructure alone, the Refinery throughput would likely decline. Existing pipelines could possibly supply crude oil and transport products from the Refinery. As discussed above, the Chevron pipelines would require modification and upgrading, as well as installation of connections between the Navy depot (located at the north-west end of the POLA) and the respective terminals. The availability of the non-Chevron pipelines is unknown and modification to some pipelines to handle crudes and provide connections to El Segundo would likely be necessary. In addition, aside from the proposed Pier 400 project (see Section 3.3.4, VLCC Use of Pier 400), the existing POLA/POLB terminals are probably not able to handle the El Segundo Refinery products and may not have the capacity to transport the crude oil through their facilities to the Refinery. All of these factors could seriously limit the crude imports and product exports at the Refinery.

Approximately 80 percent of the Refinery crude oil is received through the Marine Terminal, with the remaining crude oil primarily received from onshore fields through pipelines. This totals approximately 54,000 bpd of crude oil received by pipeline. The existing Pacific Pipeline, which transports crude oil from onshore oil fields to the Refinery, could carry an additional 80,000 bpd of oil to the Refinery and Line 93 could carry an additional 75,000 bpd, for a total of 209,000 bpd potentially received by pipeline. This would decrease the volume of crude needed from other terminals in the POLA/POLB. However, onshore crude oil production has been diminishing over the past decade and the decline is expected to continue, which may affect the availability of

crude oil to Chevron from onshore areas via pipeline. In addition, not all locally produced crude oil may be available to Chevron since other refineries in the region may also compete for those resources. However, Chevron has access to equity crudes and has begun accessing those crudes from the San Joaquin Valley and is expected to increase pipelined volumes of crude over the lease life.

Another option would use trucks to transport crude and refined products that exceed the capacity of existing pipelines through the POLA/POLB. Significant transportation of crude oil or products via truck is not physically feasible or environmentally desirable. To supply the entire amount of crude lost from the Marine Terminal and transport finished product from the Refinery to customers, at least 1,500 tanker trucks would be necessary to bring crude oil to the Refinery and carry out product each day. Trucks currently provide a small amount of crude oil or raw materials to the Refinery (less than 0.5 percent, or approximately 10 trucks per day); a truck terminal is available to handle current activity.

Rail transportation could transport materials into and out of the Refinery to meet the Refinery's requirements that exceed the capacity of other transportation methods. However, extensive transportation of crude oil or refined products via rail is physically infeasible. Transporting large volumes of oil via rail would also be difficult logistically. The Refinery currently imports approximately 1.5 percent of its crude oil supplies by rail through an existing facility. However, increasing rail traffic would cause delays to surface vehicles along routes near the Refinery. Additionally, most of the Refinery's current and future crude oil supply sources are not accessible by rail.

For the purpose of this EIR, it is assumed that under the No Project Alternative, various crude transportation methods would bring sufficient crude into the Refinery to continue its operation. Transportation methods would include crude oil arriving at the POLA/POLB and then traveling through pipelines to the Refinery, an increase in volumes through the existing onshore Pacific Pipeline, and less than 10 percent would be transported via truck or rail. Accordingly, the collective potential environmental impacts of these transportation methods are described and analyzed in this EIR. For the purposes of this EIR, it is assumed that the No Project Alternative's decommissioning schedule would consider utilizing one or more of these transportation methods. Any future crude oil or product transportation alternative would require subsequent applications to the CSLC and any other agencies with jurisdiction depending on the proposed alternative.

Decommissioning, abandoning, or deconstructing the Marine Terminal would require a separate CEQA review. Since details associated with decommissioning, abandoning, or deconstructing the Terminal would be developed as necessary, for the purposes of this EIR potential impacts will be discussed only generally.

3.3.2 CBM Relocation in State Waters for Crude Only

Under this alternative the Berth 4 CBM and navigational moorings would be relocated into deeper water approximately two miles (3.2 km) offshore for crude oil offloading only. This would allow very large crude carriers (VLCC) to moor at the CBM and offload the crude without lightering operations. This location, approximately two miles (3.2 km) offshore, is the maximum practical distance to relocate the CBM system because of water depth, impact on operations, and several other factors. Panamex-size tankers would load refined products and offload crude at the existing Berth 3 CBM, which would remain in the same location under this alternative. The maximum water depth for safe operation of a CBM is 90 feet (27.4 m); in deeper water, delays in mooring tankers would reduce terminal capacity. To reach 90 feet (27.4 m) of water, the Berth 4 buoys would be relocated approximately 0.6 miles (1.0 km) farther offshore than the existing Berth 4 (Berth 4 is 1.5 miles [2.4 km] offshore). Permits from the United States Coast Guard (USCG), California Coastal Commission (CCC), and other agencies would be required for this relocation.

Relocating or re-placing the existing Berth 4 CBM into deeper water would require removing the existing buoys, installing new buoys in deeper water, extending the existing pipelines that serve Berth 4, replacing equipment, and modifying some onshore pumping facilities to accommodate higher pressure from the longer pipelines. Examples of pump modifications include replacing pump impellers and installing a 100-horsepower booster pump to maintain pressure and improve capacity in the longer pipeline.

Under this alternative, the single set of pipelines at Berth 4 would be extended while the new moorings for Berth 4 would be installed to avoid a lengthy disruption of Refinery operations. Removal of the old moorings and transfer of the system to the outer berth would occur during scheduled annual Refinery turnarounds over several successive 24-hour periods.

Relocating the Berth 4 CBM and navigational buoys would place them within recreational boat routes from Marina Del Rey and the Palos Verdes Peninsula to Santa Catalina Island. Additional buoy markers and signage would be required to discourage

recreational and sport vessels from traveling directly through the Marine Terminal berths and between the moorings and the shore. The existing USCG Safety Zone could need to be extended.

Installing a CBM in deeper waters farther from shore would allow VLCC tankers from the Middle East to moor directly at the Marine Terminal, thereby eliminating lightering operations related to the Marine Terminal and reducing the number of vessel calls and associated moorings at the Marine Terminal while retaining the same crude oil throughput, thereby reducing spill risk as well as air quality, visual, and other impacts. Some lightering operations would continue from VLCC to provide crude to the other terminals (such as the Chevron San Francisco Bay Area Richmond Refinery), which in turn would continue potential lightering oil spill impacts.

The VLCC tankers have a draft of up to 74 feet (22.6 m), which prevents them from directly utilizing the current berths in water 64 to 77 feet (19.5 to 23.5 m) deep. Crude oil from the Middle East has accounted for as much as 50 million barrels (bbl) per year between 2000 and 2004 at the Marine Terminal. Eliminating lightering associated with the Marine Terminal would reduce vessel traffic at the Marine Terminal by approximately 49 vessel calls per year (elimination of 94 lightering vessels and an addition of 45 VLCC vessels) for current operations and an estimated 68 vessel calls per year (elimination of 132 lightering vessels and addition of 63 VLCC vessels) by the year 2040 (see lightering discussion in Section 2.0, Project Description).

3.3.3 SPM Replacement in State Waters for Crude Only

Under this alternative, the Marine Terminal would continue to operate, but the existing Berth 4 CBM would be decommissioned and replaced with an SPM farther from shore in State waters. This would allow VLCC to moor at the SPM and offload crude without lightering operations, similar to the CBM alternative. Some lightering operations would continue from VLCC to provide crude to other terminals, which in turn would continue potential lightering oil spill impacts.

An SPM allows a ship to weathervane around the buoy to find a stable position, and thereby minimizes the environmental impact on the system since the moored ship can readily adjust into prevailing weather without affecting offloading operations. The two most common types of SPM are the catenary anchor leg mooring (CALM) system and the single anchor leg mooring (SALM) system. The CALM system is a set of eight anchored catenary legs positioned in a radial pattern at a 45-degree spread around a large buoy, 60 feet (18.3 m) in diameter and 25 feet (7.6 m) deep, which is connected to

a flow line from the sea floor for transporting liquids. The SALM consists of a vertical buoyant riser, 15 feet (4.6 m) in diameter and 70 feet (21.3 m) deep; a foundation; a pre-tensioned leg from the sea floor to the riser; and a flow line from the sea floor to the surface. The advantages of a SALM over a CALM are forgiveness of collisions with the mooring system due to the nature of its restoring force and a lower likelihood of contact and entanglement since the leg is located directly beneath the buoy. A disadvantage of both systems is an increased length of hose that floats on the water surface to allow for the movement of the moored vessels. However, the recently established USCG Safety Zone around the Marine Terminal should keep the area free of most maritime traffic (see Section 4.7, Land Use, Planning, and Recreation).

The USCG determined that SPM are the least risky method to import crude oil because they decrease the likelihood, environmental impact, and severity of accidents due primarily to their location farther offshore than conventional moorings (Salancy 1994). The SPM are typically used in water between 100 and 400 feet (30.5 and 121.9 m) deep. At the Marine Terminal, the minimum distance offshore and within CSLC jurisdiction for SPM would be approximately 2.7 miles (4.3 km) in water 130 feet (39.6 m) deep. The maximum practical distance offshore would be dictated by the existing sub-sea pipeline and onshore facility rather than SPM technology limits. A 1997 feasibility study of SPM at El Segundo and Morro Bay in southern California proposed installing SPM in water 1,000 feet (304.8 m) deep, six to 12 miles (9.7 to 19.3 km) offshore (Salancy 1994). However, extending the existing sub-sea pipelines that far would require additional pumping capacity onshore and would also limit the unloading rate of tanker pumps. The maximum practical distance offshore of a SPM at the Marine Terminal would be approximately 3.5 miles (5.6 km) offshore in water 160 feet (48.7 m) deep for the Berth 4 extension. To avoid intruding into Federal waters and the delays that would accompany the licensing requirements of the Deepwater Port Act of 1974, the maximum distance for Berth 4 would be three nautical miles (4.8 km) from shore. Regardless of the exact locations, permits from the USCG, CCC, and other agencies would also be required for the extension.

Installing an SPM would require extending the existing pipelines, abandoning the existing Berth 4, installing the SPM farther offshore, and modifying the Marine Terminal pumping facilities to accommodate higher pressure from the longer pipelines. Constructing this pipeline system would require a larger derrick than the derrick used to extend the Berth 2 pipelines in 1993 because of longer and thicker hoses. The extra length would be necessary to reach from the SPM buoy to ship connections, typically half the length of the ship, or more than 500 feet (152.4 m). The hose diameters are

typically 16 to 24 inches (40.6 to 70.0 cm). In addition, a larger vapor compressor would be necessary. Minor modifications to pumping, similar to those involved in the CBM Relocation in State Waters for Crude Only alternative, would also be necessary. Finally, the more complex equipment in this system would require longer fabrication time.

An SPM is a complex piece of equipment that can measure up to 40 feet (12.2 m) in diameter and, along with its associated hoses, requires a high degree of maintenance. Because of the demanding maintenance requirements, a 1.4-acre (0.6 hectares), 200 by 300 feet (70.0 by 91.4 m) maintenance yard would be constructed, probably on a site at the POLA/POLB. This yard would be similar to, but larger than, the site used to construct and stage the installation of the Berth 2 pipeline extension in 1993. This facility would provide a covered, fenced area for storing, repairing, and maintaining equipment potentially including the single point swivel, a complete spare buoy, and associated hoses, chains, and hawsers.

A tank vessel using an SPM needs a large unobstructed area of water, a circle approximately 0.6 miles (0.9 km) in diameter, so it can swing freely around the mooring with the prevailing wind. Maintenance of the more complex equipment would require one additional full-time staff person and a two-fold increase in maintenance activities. This system would also require increased personnel training and revised operating procedures.

As with the installation of the Berth 4 CBM farther offshore, the installation of an SPM would enable VLCC tankers to utilize the Marine Terminal directly instead of through lightering vessels. This would reduce vessel trips to the terminal as previously discussed, thereby reducing spill risk as well as air quality, visual, and other impacts.

3.3.4 VLCC Use of Pier 400

Under this alternative, the Marine Terminal would continue to operate, but a portion of Marine Terminal operations would utilize the recently permitted Pier 400 facility. Due to safety concerns associated with the pipeline transporting products (e.g., gasoline, jet fuel) through populated areas and the modification and heating requirements of transporting heavy crude oil through pipelines from the POLA/POLB, the only Marine Terminal traffic displaced under this alternative would be the VLCC traffic that currently transports light crude oil to the Refinery by lightering offshore and using smaller tankers to call on the Marine Terminal. Under this alternative, all exports of refined product and imports of heavier crude oil would continue using the existing Marine Terminal.

Some lightering operations would continue from VLCC to provide crude to other terminals, which in turn would continue potential lightering oil spill impacts.

Pier 400 is a recently permitted deep-water, petroleum bulk liquids marine offloading and storage facility proposed for Berth 408 and related storage facilities on Terminal Island in the POLA. The Pier 400 facility is designed to import crude oil and partially refined crude oil. Pier 400 would accommodate tankers up to and including VLCC size. The EIR evaluating Pier 400 facilities projected average throughput in the first year, 2010, to be 350,000 bpd, which could increase to 500,000 bpd in 2015, but would require an agency-approved modification to the facility's emissions permit. These levels exceed the projected additional crude imports to southern California by approximately 133,000 bpd, indicating that the POLA would introduce excess import capacity to the port area (POLA 2008). However, both the final lease agreement and construction permits have yet to be issued for Pier 400, and consequently the potential commencement of operations in unknown.

Pier 400 would have storage capacity up to four million bbl, which would allow for offloading large tankers, with subsequent transfer of materials to the respective refineries.

Pier 400 would incorporate features to reduce air emissions, including alternative marine power (cold ironing), shore-side pumping that reduces the need for vessels to generate power to operate vessel cargo pumps, low sulfur fuel requirements, and vapor recovery. While the majority of tankers are not able to use this system, some tankers would be able to use cold ironing and reduce emissions. Oil spill booms deployed during tanker offloading operations would be one of the safety features at Pier 400.

This alternative could use existing pipelines to connect Pier 400 to the Refinery. As mentioned previously and detailed in Table 3-1, the Chevron pipelines do not have direct connections to the Pier 400 site, so some pipeline modification would be necessary. It is estimated that with the EPTC pipeline and the existing Chevron pipeline, with some modifications, could transport up to 50,000 bpd.

Using Pier 400 for lighter crude oils would enable VLCC tankers from the Middle East to avoid offshore lightering to access the Marine Terminal. This could potentially reduce Marine Terminal traffic by an estimated 132 vessel calls (of lightering vessels) during year 2040 operations. The corresponding increase in traffic at the POLA Pier 400 would be an estimated 63 vessel calls annually. However, since Chevron uses the Pacific Area Lightering process to distribute crude oil to its west coast refineries at the San Francisco

Bay Area Richmond and El Segundo terminals, as well as other terminals, and depending on future operations at the El Segundo Refinery, these numbers could increase or decrease over time.

A number of uncertainties are associated with the Pier 400 alternative, including:

- Feasibility of using the Pier 400 facility is somewhat unknown because the facility has not been built and is not in operation at the time of this writing;
- Due to potential vessel berthing restrictions, tank capacity, and flow rates at Pier 400 a VLCC may have to call on the berth twice; and
- This alternative could use existing pipelines as discussed previously, but some pipeline modifications and new pipeline construction would be required.

Despite the uncertainties, this alternative is fully analyzed in the EIR.

3.4 COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

The CEQA Guidelines (Section 15126.6 [d]) require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. The Guidelines (Section 15126.6 [e][2]) further state, in part, that "if the environmentally superior alternative is the 'No Project Alternative,' the EIR shall also identify an environmentally superior alternative among the other alternatives."

The following discussion compares impacts associated with the proposed Project with those associated with the No Project Alternative and the other alternatives. These impacts are identified as a result of the analysis provided in Section 4.0, Environmental Analysis. An alternative would be considered superior to the proposed Project if there would be a reduction in impact classification. In cases where the impact from an alternative is in the same class as for the proposed Project, differences in severity of the impact are analyzed.

In evaluating the proposed Project and the various alternatives, there are several key issue areas to consider. First and foremost, potential impacts associated with accidental oil spills are a key concern. The relative impact to public safety and health is also a critical component in the evaluation of alternatives. Finally, quality of life issues, such as visual resources, air quality, and recreational impacts, must be considered.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
Section 4.1 System Safety and Reliability							
SSR-1	Potential for Fires and Explosions	I	I↑	I	I	I↑	The No Project and Pier 400 could redirect shipments through more populated areas. Pier 400 already requires the use of inert systems.
SSR-2	Potential for Spills	I	I↓	I	I	I↓	The consequences of spills under the No Project and Pier 400 would be reduced. The frequency of spills under the offshore berths alternatives would be reduced, but severity of consequences may increase due to larger vessels.
SSR-3	Disturbance of Potentially Contaminated Seafloor Sediments	II	II	II↑	II↑	II	Increased lengths of pipeline installation/replacement under the offshore berths alternatives.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
Section 4.2 Water and Sediment Quality							
WSQ-1	Oil Spills	I	I↓	I	I	I↓	Water-quality impacts would shift location as vessels transport to other terminals under the alternatives, but spills would remain significant.
WSQ-2	Disturbance of Seafloor Sediments	II	NI	II↑	II↑	II	Relocation of the moorings would erode a new area of potentially contaminated sediment, but its impact would still be mitigable.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
Section 4.3 Biological Resources							
BIO-1	Oil Spill Impacts to Marine Biological Resources	I	I↓	I	I	I↓	The consequences of spills under the No Project and Pier 400 would be reduced. The frequency of spills under the offshore berths alternatives would be reduced, but severity of consequences may increase due to larger vessel volumes.
BIO-2	Oil Spill Impacts to Commercial and Recreational Fishing	I	I↓	I	I	I↓	No Project would result in shift to onshore/pipeline transport.
BIO-3	Vessel Traffic and Marine Construction Impacts to Biological Resources	II	II↓	II	II	II↓	
BIO-4	Vessel Traffic and Marine Construction Impacts to Commercial and Recreational Fishing	II	II↓	II	II	II↓	No Project would result in shift to onshore/pipeline transport. Incremental traffic increase compared to existing baseline at Pier 400 would be minimal.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
BIO-5	Oil Spill Impacts to Onshore Biological Resources	I	I↓	I↓	I↓	I↓	Siting terminal farther offshore would reduce potential frequency for oil spills to contact shoreline.
Section 4.4 Air Quality							
AQ-1	Exceedance of Incremental Health Risk Threshold During Project Operations	I	I	I↓	I↓	I↓	No Project could generate health risks due to other means of transportation. Berths farther away from shore would have a lower health risk impact. The lower emissions at the Pier 400 facility would reduce emission impacts. Note: increase peak day criteria emissions with berths alternatives, decreased GHG emissions within SCAB with alternatives.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
AQ-2	Emissions of Greenhouse Gases Within the SCAB Could Exceed SCAQMD Thresholds	I	I	III	III	III	No Project could produce similar, greater than or less GHG emissions depending on crude source. Reduction in vessel traffic for CBM, SPM, and Pier 400 alternatives would be less than significant.
AQ-3	Exceedance of Air Quality Standards During Construction – No Project Alternative	III	I	III	III	III	No Project would exceed daily construction thresholds as abandonment would require more construction.
AQ-4	Criteria Emissions Associated With Vessel Operations Would Exceed SCAQMD Thresholds	III	III	I	I	III	Emissions from using a VLCC at the Marine Terminal would exceed SCAQMD thresholds.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
Section 4.5 Aesthetics							
AES-1	Oil Spills Affect Visual Quality	I	I↓	I	I	I↓	The consequences of spills under the No Project and Pier 400 would be reduced. Under all alternatives, fewer vessels would visit the Marine Terminal.
Section 4.6 Geological Resources							
GEO-1	Rupture of Facilities from Earthquake Motion	I	NI	I↑	I↑	I↓	Pumping time would be the same for berth alternatives. Pier 400 would have larger pumps and less pumping time.
GEO-2	Oil Spills from Tsunami Wave Damage	I	NI	I	I	I↓	
GEO-3	Oil Spills as a Result of Liquefaction	I	NI	I	I	I↓	
Section 4.7 Land Use, Planning, and Recreation							
LUPR-1	Accidental Oil Releases Could Affect Recreational Activities	I	NI	I	I	I	See Impact SSR-2
LUPR-2	Effect on Vessel Traffic Near New Mooring	NA	NA	II	II	NA	The new mooring could create additional effects on recreational boaters.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
Section 4.8 Noise							
NOI-1	Construction Could Increase Noise Levels at Beach Areas	II	II	II	II	II	Construction could occur for all alternatives.
Section 4.9 Energy and Mineral Resources							
ENE-1	Loss of Petroleum Refining Capacity or an Increase in Energy Supply Disruptions in Southern California	NI	I	NI	NI	NI	No Project temporary loss of refining capacity or energy supply disruptions due to abandonment of Marine Terminal.
Section 4.10 Cultural Resources							
CUL-1	Damage to or Disruption of Prehistoric or Historic Resources	II	II	II	II	II	Construction could occur for all alternatives.
CUL-2	Damage to or Disruption of Prehistoric or Historic Resources During Offshore Activities	NA	NA	II	II	NA	Potential impacts of the construction of pipelines farther offshore.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
Section 5.0 Socioeconomics and Environmental Justice							
SOC-1	Displacement or Termination of Economic Activity	III	I	III	III	I	The No Project would reduce Refinery throughput, thereby potentially displacing economic activity. Increased use of the ports could cause port closures if there is a spill (for No Project and Pier 400).
SOC-2	Decreased Fuel Supply and Increased Fuel Supply Demand	III	I	III	III	III	No Project would reduce Refinery throughput, thereby reducing southern California fuel supply and increasing demand for delivery and utilization of basic public services that cannot be met by the government.

Table 3-3
Summary of Environmental Impacts for the Proposed Project and Alternatives

Impact Class:
I = Significant adverse impact that remains significant after mitigation.
II = Significant adverse impact that can be eliminated or reduced below an issue area's significance criteria.
III = Adverse impact that does not meet or exceed an issue area's significance criteria.
IV = Beneficial impact.
NI = No Impact; NA = Not Applicable; NC = Not Classified
↑ ↓ = Increase/decrease in severity

Impact No.	Impact Description	Proposed Project	No Project	CBM Berth 4 State Waters	SPM Berth 4 State Waters	Pier 400	Explanation
EJ-1	Increased Use of Pipelines Could Adversely Affect Populations	NI	I	NI	NI	I	Increased use of pipelines due to the loss of the Marine Terminal or the increased use of port facilities could cause impacts to populations.

3.4.1 The Proposed Project Versus the No Project Alternative

The No Project Alternative would result in no new lease being issued for the Marine Terminal and would result in abandonment of the Marine Terminal facilities, requiring crude inputs and product exports to and from the Refinery to develop other means of transportation. Although the long term disruption to the Refinery capacity could be minimal, in the near and mid-term, for a period of at least a few years, there would be a substantial drop in the transportation capabilities of the Refinery which would cause a disruption in Refinery output. There would also be an increase in the potential for energy supply disruptions since only two ports in Southern California, the POLA and POLB, would receive crude oil. This is summarized in Impact **ENE-1**, which would be an additional significant, Class I impact.

The No Project Alternative would also require the Refinery to transport all crude and product by pipeline through populated areas, which would be an increase in severity of the risk of fire and explosions (Impact **SSR-1**) and a potential environmental justice impact (Impact **EJ-1**).

Abandonment of the Marine Terminal would also produce construction related emissions that could exceed the South Coast Air Quality Management District (SCAQMD) thresholds for construction. This would be an additional significant impact.

There would be an associated increase in spill risk at the ports and offshore of the ports, which could impact biological resources such as kelp beds near Palos Verde (although there would be a net decrease in biological impacts due to the lack of spill risk in Santa Monica Bay) or could cause closure of the ports with resulting socioeconomic impacts.

However, as transportation by pipeline or other methods would not require loading and unloading vessels in the open waters at the Marine Terminal, the severity of spill risks would decrease, which would also result in a net decrease in spill effects on aesthetics, biology and recreation. Also, since there would no longer be facilities at the Marine Terminal, geological impacts would no longer occur.

The No Project would also result in continuing lightering operations with the crude being directed both to other terminals to the north and to the POLA/POLB and subsequently transferred to the Chevron Refinery. As a result, oil spill impacts from lightering would continue to occur under the No Project Alternative.

3.4.2 The Proposed Project Versus the CBM Alternative

The CBM in state waters alternative would involve relocation of the existing Berth 4 (crude-oil-only berth) to deeper water within state waters. This would enable the larger, VLCC-class vessels to berth directly at the Marine Terminal and eliminate the additional vessel calls associated with lightering related to Marine Terminal operations in Federal waters. However, lightering operations for tankers destined for other terminals would likely continue. This alternative would involve the installation of additional pipelines to reach the new berth location, most likely an extension of the existing Berth 4 pipelines.

This alternative would have similar spill risks as the proposed Project. Although the number of vessel visits to the Marine Terminal would decrease due to the elimination of Marine Terminal related lightering, with an associated reduction in spill frequency, the VLCC vessels that would visit the new Berth 4 would be larger, resulting in a potentially larger worst-case spill scenario.

Some lightering operations would continue from VLCC to provide crude to the other terminals, such as the Chevron San Francisco Bay Area Richmond Refinery, which in turn would continue potential lightering oil spill impacts.

Also, since additional pipelines would have to be installed, there would be an increase in impact severity associated with potential disturbances of seafloor sediments.

Air quality impacts associated with peak day criteria emissions would be more severe than the proposed Project since the larger vessels would generate more emissions during the peak day than the proposed Project. However, air quality impacts related to greenhouse gases (GHG) would be less severe since fewer vessels would operate within the South Coast Air Basin (SCAB) and, because Berth 4 would be farther away from shore, impacts of diesel emissions on health risk would be lower.

Some impacts would also occur to recreation associated with recreational vessel traffic near the extended berth.

The impacts on aesthetics would be less than those of the proposed Project since fewer vessels would visit the Marine Terminal and some of them would be farther away. Spill impacts on aesthetics would remain the same as the proposed Project.

3.4.3 The Proposed Project Versus the SPM Alternative

The SPM alternative would involve relocation of the existing Berth 4 (crude-oil-only berth) to deeper water within state waters and utilizing a single point mooring system instead of a CBM. This would enable the larger, VLCC-class vessels to berth directly at the Marine Terminal and eliminate the additional vessels visits associated with lightering related to Marine Terminal operations in Federal waters. However, lightering operations for tankers destined for other terminals would likely continue. This alternative would involve the installation of additional pipelines to reach the new berth, most likely an extension of the existing Berth 4 pipelines.

Impacts related to the proposed Project would be similar to those analyzed under the CBM alternative. Spill risks associated with the use of a SPM versus a CBM are similar; there may be some disadvantages of an SPM due to the longer hose required and the increased maintenance, yet there would also be some advantages of an SPM due to the ability of SPM to maneuver during inclement weather (less of an issue in the near-shore environment of this alternative than if it was farther out to sea). However, the differences are negligible. Some lightering operations would continue from VLCC to provide crude to other terminals, which in turn would continue potential lightering oil spill impacts.

3.4.4 The Proposed Project Versus the Pier 400 Alternative

The Pier 400 alternative would direct the larger, VLCC-class vessels carrying light crude to Pier 400 for unloading and would utilize existing pipelines that would require some modifications to transport the crude oil to the Refinery. Unloading of other crude vessels and the loading of product would still occur at the Marine Terminal. Unloading of crude oil from VLCC-class vessels could still technically take place at the Marine Terminal under emergency situations through lightering. This alternative would most likely require the modification and upgrading of existing pipeline systems between the Refinery and the Pier 400 facility.

This alternative would present a reduction in fire and explosion risk since the POLA facility currently requires the use of inert gas for all vessels. However, fire risks to populations along pipeline routes could increase and create environmental justice impacts. There would be a reduction in spill risk since fewer vessels would visit the Marine Terminal, which would result in a net decrease in spill effects on aesthetics, biology, and recreation. Although additional vessels would visit the Pier 400 facility, the Pier 400 facility is within an enclosed berth and vessels are required to be completely

boomed during unloading. Although a spill at the Pier 400 facility would still be considered a significant impact on biological and socioeconomic resources, it would be less a severe impact on biological resources than a spill at the open-ocean Marine Terminal location. However, some lightering operations would continue to occur from VLCC to provide crude to other terminals, which in turn would result in continuing potential lightering oil spill impacts.

Impacts on air quality would be similar to the proposed Project as the peak day emissions of criteria pollutants would be similar. Emissions of GHG would be less than the proposed project as fewer vessels would visit the Marine Terminal/Pier 400 and some vessels would be able to utilize the POLA emission reduction features (such as shore-side electricity).

As fewer vessels would call at the Marine Terminal, there would be a reduction in health risk associated with diesel emissions. Although diesel emissions would occur at Pier 400, the requirements for cold ironing (use of onshore electric pumps and power) would reduce the emissions over the proposed Project levels over the lease term. Since fewer vessels would be using the Marine Terminal, there would also be a reduction in severity of impacts during a geological event.

3.4.5 The Environmentally Superior Alternative

The CBM and SPM berth alternatives and the Pier 400 alternative would all lessen the severity of some significant impacts associated with the proposed Project. The CBM and SPM alternatives would also increase the severity of some impacts and neither of these alternatives would lessen the severity of significant spill risk impacts.

The Pier 400 alternative would take advantage of infrastructure developments by the POLA to reduce air emissions and measures instituted in ports to contain and reduce the impacts of spills. However, there are some uncertainties associated with the Pier 400 alternative. The Pier 400 project has not been constructed at this writing. In addition, the exact capacities and integrity of the pipelines between the Refinery and the POLA are not known at this time. The extent of the required modifications to pipelines to enable them to transport crude oil from the Pier 400 facility to the Refinery is not known and the modifications may require permits from other agencies, which may take a substantial amount of time.

Spills from vessels approaching the POLA could have a greater impact on shoreline areas south of those potentially impacted by vessels visiting the Marine Terminal,

depending on the spill location and subsequent transport. However, the increased use of the POLA under this alternative would only change the geographic location of the sensitive receptors potentially impacted by the spill.

A spill in the POLA could cause a shutdown of the port, similar to the *M/V Sammi Superstars* spill in the POLB, causing socioeconomic impacts related to closure of the port and loss of revenue for businesses. Adding pipeline capacity from Pier 400 to the El Segundo Refinery would likely be a significant environmental justice issue.

Under the Pier 400 alternative, lightering operations would still occur as a result of the transportation of crudes from the VLCC to other terminals. In addition, with potential vessel berthing restrictions, tank capacity, and flow rates at Pier 400, a VLCC may have to call on Pier 400 twice. The feasibility of using the Pier 400 facility is somewhat unknown because the facility is not in operation at the time of this writing and the likelihood of its use is somewhat speculative so it cannot be considered under the environmentally superior alternative.

Both of the berth extension alternatives also reduce the severity of some significant impacts, including GHG emissions and aesthetics. However, there would be additional impacts to recreational boating due to a berth located farther from shore, and emissions of criteria pollutants would increase due to the use of larger vessels on the peak day.

Although the CBM and SPM alternatives have the benefits to spill risk of reducing the number of vessel visits, the larger vessels located close to shore would increase the size of a worst case spill, thereby making the spill risk similar to the proposed Project.

Given these issues, the impacts of the proposed Project, the CBM and SPM alternatives were determined to be similar and any of these, along with the proposed Project, could be the environmentally superior alternative.

3.5 CUMULATIVE RELATED FUTURE PROJECTS

Section 15130 of the CEQA Guidelines requires that an EIR discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in Section 15065(c). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," that lead agency need not consider that effect significant but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. As defined in Section 15355 of the CEQA Guidelines, a cumulative impact is a combination of the impact of the project

evaluated in the EIR and the related impacts of other projects. An EIR should not discuss impacts that do not result in part from the project evaluated in that EIR.

The following discussion provides a description and maps identifying other related future projects near the location of the proposed Project and alternatives.

3.5.1 Boundary of Cumulative Projects Study Area

Cumulative projects include those projects that, in conjunction with the proposed project, can potentially cause cumulatively significant adverse environmental impacts. The area within which cumulative impacts could occur depends upon the project activity and type of impact. For routine operations, the cumulative impact study area is the area surrounding the project facilities. For this proposed Project, that area includes the offshore Marine Terminal facilities and surrounding waters (see Figure 2-4) and the onshore Marine Terminal facilities and adjacent land uses (see Figure 2-8). Under accident conditions and for impacts involving safety, water quality, biology, and recreation the cumulative study area would extend beyond that region to include the area potentially affected by a spill from the Marine Terminal or adjacent shipping lanes. This area extends from Santa Monica Bay to the Channel Islands in the north and to Santa Catalina Island to the south and includes the POLA/POLB.

3.5.2 Description of Cumulative Projects

General Description of Cumulative Environment

Santa Monica Bay stretches from Point Dume in the north to the southern tip of the Palos Verdes Peninsula in the south (see Figure 2-1). The northern portion of the coast bordering the Bay is mountainous, the central portion is flat land and sandy beaches, and the southern portion near the Palos Verdes Peninsula is rocky cliffs. The Bay is bordered by the cities of Malibu, Santa Monica, Venice, Marina Del Rey, Playa Del Rey, El Segundo, Manhattan Beach, Hermosa Beach, Redondo Beach, Palos Verdes Estates, and Rancho Palos Verdes (from north to south).

Several municipal wastewater treatment facilities discharge into the Bay; the largest is the Hyperion Treatment Plant, located north of and adjacent to the Marine Terminal. Industrial dischargers in the area include the Southern California Edison El Segundo Power Plant, located south of the Marine Terminal; the Los Angeles Department of Water & Power Scattergood Plant, located north of the Marine Terminal; and the Chevron Oil Refinery, which passes through the Marine Terminal. A major outlet for

surface runoff into the Bay is Ballona Creek, located approximately four miles (6.4 km) north of the Marine Terminal.

Marine Facilities

The Marine Terminal is located in the Santa Monica Bay between two recreational boating marinas. Marina Del Rey to the north of the Project site houses approximately 6,000 docked recreational vessels and 20 docked sport-fishing vessels. King Harbor in Redondo Beach, located south of El Segundo, docks approximately 1,400 recreational vessels and 20 sport-fishing vessels. Approximately 8,000 other recreational boats and 60 sport-fishing vessels are docked elsewhere within Los Angeles, Ventura, and Orange counties.

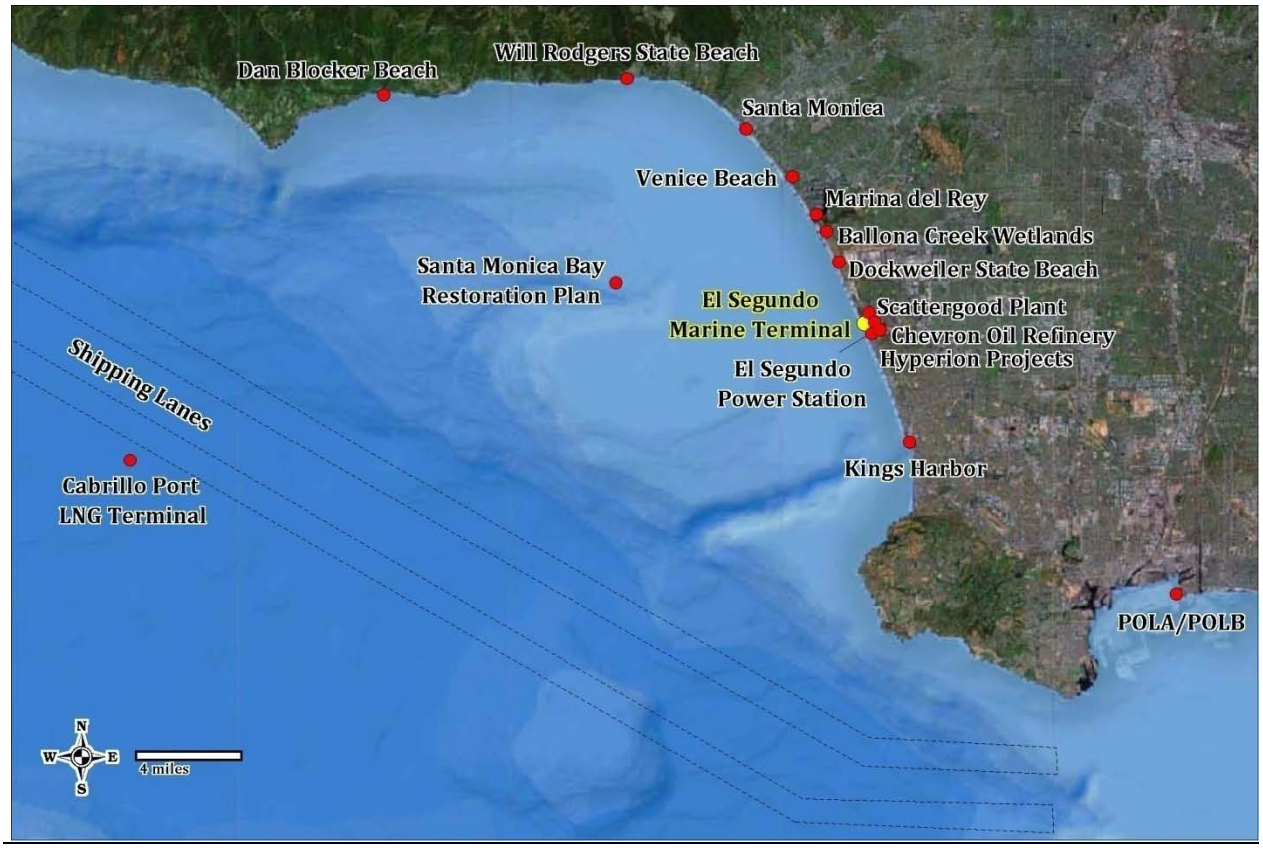
Besides Chevron's Marine Terminal, the POLA and POLB contain the area's major oil marine terminals. A total of 13 terminals at these ports transport crude oil and petroleum products into and out of the region.

Facilities and Communities Near the Marine Terminal

The surrounding onshore land uses in the vicinity of the Marine Terminal include Dockweiler State Beach; the Hyperion Treatment Plant; residential uses in El Segundo to the north; commercial and light industrial land uses and the Chevron El Segundo Refinery to the east; and the Los Angeles Department of Water and Power Scattergood Plant and a residential community within the city of Manhattan Beach to the south.

The following projects have been identified for evaluation because of their potential cumulative impacts in conjunction with the proposed Project. Most focus on improvements to the water quality of Santa Monica Bay. However, the last projects described are associated with marine terminals and port operations that are not within the immediate study area, but that could affect commercial marine traffic in Santa Monica Bay and San Pedro Bay. Figure 3-1 shows the locations of these projects.

Figure 3-1
Regional Projects Cumulative Evaluation



Chevron El Segundo Refinery Projects

Chevron obtained permits from the SCAQMD that allow modifications to its El Segundo Refinery, thereby enabling it to refine heavier crude oil. The Refinery currently processes both heavy and light crude oils to produce motor fuels and other saleable petroleum products. Heavy crude oils are denser and more viscous than light crude oils and generally produce smaller quantities of motor fuels per barrel than light crude oils. Since most new crude oil discoveries in the world are heavier than historic crude oil supplies, Chevron's modifications to the Refinery will allow it to maintain or minimally increase current production levels of saleable petroleum products by processing more heavy crude oil and less light crude oil. Maintaining current production levels of saleable products by processing more heavy crude oil will require an annual increase of approximately five percent in the total amount of crude oil processed by the Refinery. Modifications to the Refinery will also reduce sulfur dioxide emissions from Refinery fuel gas combustion.

To process more heavy crude oil, the Refinery operators proposed modifications to the No. 4 Crude Distillation Unit and the Delayed Coking Unit. Chevron also proposed modifications to the No. 6 Hydrogen Sulfide Plant to improve the removal of sulfur compounds from Refinery fuel gas to comply with SCAQMD Regulation XX - Regional Clean Air Incentives Market and to increase the reliability of the removal process.

The proposed Refinery modifications were determined to be a "project" under CEQA definitions (California Public Resources Code [PRC] Section 21000 et seq.). The SCAQMD is the lead agency because it has primary approval authority over the project; therefore, it prepared and certified a Final EIR pursuant to State CEQA Guidelines 15089 and 15132 (SCAQMD 2006).

Chevron also obtained the first set of permits from the SCAQMD, the lead agency, for its Product Reliability and Optimization (PRO) Project. The PRO Project includes modifications to the No. 2 Crude Unit, No. 2 Residuum Stripper Unit, Minalk/Merox Unit, Waste Gas Compressors, Fluidized Catalytic Cracking Unit, Alkylation Unit, Vacuum Residuum Desulfurization Unit, ISOMAX Unit, Cogeneration Facilities, and the Railcar Loading/Unloading Rack. The purpose of the PRO Project is to increase the reliability, energy efficiency, and capacity of specific existing Refinery processing equipment; allow the processing of a wider range of crude oils; and voluntarily reduce potential atmospheric emissions from existing pressure relief devices.

The proposed Chevron PRO Project was determined to be a "project" under CEQA definitions (PRC Section 21000 et seq.). The SCAQMD is the lead agency because it has primary approval authority over the Project; therefore, it prepared and certified a Final EIR pursuant to State CEQA Guidelines, Sections 15089 and 15132 (SCAQMD 2008). Certification of the addendum to the Final EIR is currently under consideration.

Hyperion Projects

The city of Los Angeles launched the Sludge-Out to Full Secondary Program in 1980. This $1.4 billion construction program replaced nearly every 1950-vintage wastewater processing system at the Hyperion Treatment Plant while the plant continuously treated 350 million gallons per day (mgd) and met all National Pollutant Discharge Elimination System permit requirements. Completed in 1998, the massive effort meant the end of spills at the Hyperion Treatment Plant; a 95 percent reduction in the amount of wastewater solids going into Santa Monica Bay; the elimination of the Bay's ecological dead-zone near the mouth of the sludge outfall; vast improvements in biological integrity of the bottom-dwelling marine community; and remarkable increases in the relative

abundance of many indicator species. The plant has a dry-weather capacity of 450 mgd for full secondary treatment and an 850-mgd wet-weather capacity. Current flow is 340 mgd. The Hyperion Treatment Plant is a state-of-the-art full secondary treatment facility.

The city of Los Angeles is currently upgrading the sewer system lines in many parts of the city. One current project is the Venice Pumping Plant Dual Force Main Sewer, which will expand capacity to ensure the continuous, safe flow of storm water during projected wet weather; help prevent sewer spillage onto city streets and adjacent surface waters; and allow for necessary maintenance, rehabilitation, and cleaning of the existing force main during dry weather. Another current project is the Adams Boulevard Relief Sewer, which is a component of the Wastewater Collection System Improvement Program in Phase II-B of the South Wilshire Sewer System Relief Project.

The Santa Monica Bay Restoration Plan

The Santa Monica Bay Restoration Plan contains more than 200 actions addressing problems, including stormwater and urban runoff pollution, wetlands degradation, and public health risks associated with consuming Bay seafood and swimming near storm drain outlets. Several "priority actions" have already been completed, including upgrading the Hyperion Treatment Plant to a full secondary treatment facility. Key objectives of the Plan include implementing pollution prevention and habitat restoration projects, promoting cutting-edge research and technology, building a comprehensive regional monitoring program, and funding programs to raise public awareness about Bay issues. Since 1992 the project has implemented pollution control projects such as storm drain outlets along Santa Monica Bay beaches; a state-of-the-art urban runoff treatment and reclamation facility in Santa Monica; and many devices to capture trash, oil, grease, and sediments in storm drains throughout the watershed. Public support helped pass Proposition 12 in 2000, which included $25 million specifically for restoration projects within Santa Monica Bay (Santa Monica Bay Restoration Commission 2008).

Marina Del Rey and Ballona Creek Sediment Control Management Plan

The entrance to Marina Del Rey requires periodic maintenance dredging to remove silt deposited by runoff from Ballona Creek. The deposited sediment is contaminated with pollutants from the Ballona Creek watershed. The elevated contaminant levels in entrance-channel sediments make disposing of dredged sediments problematic and expensive. The U.S. Army Corps of Engineers (ACOE) has found it difficult to dredge

the south entrance channel because of a lack of suitable disposal sites for the contaminated material. Because of the difficulty of properly maintaining the entrance channel, navigation safety may be threatened. In addition, re-suspension of these sediments during dredging operations raises concerns of environmental impacts. This has given rise to a number of different studies and plans to address contamination in the Marina Del Rey and Ballona Creek waters (ACOE 2005).

A related project implemented by the Los Angeles Regional Water Quality Control Board (LARWQCB) is development of a Total Maximum Daily Load (TMDL) plan, which seeks to ensure that Marina Del Rey Harbor sediments are not toxic (LARWQCB 2005). The LARWQCB finalized the TMDL Plan for Toxics and Metals for Ballona Creek that was adopted by Resolution #R2007-015 on September 6, 2007, and became effective on October 29, 2008. Similarly, the Bacteria TMDL for Ballona Creek was adopted under Resolution #2006-011 on June 8, 2006, and became effective on April 27, 2007.

In addition, to promote and implement regional efforts at source reduction within the watershed, the Los Angeles Contaminated Sediments Task Force (CSTF) is developing a Long-Term Contaminated Sediments Management Strategy to reduce the discharge of contaminants to regional ports and harbors, as well as discharges to Santa Monica and San Pedro Bays. Since the formation of the CSTF, source control efforts in the watersheds upstream from the regional ports and harbors have significantly improved. The municipal storm water program has held the inland communities accountable for polluted runoff discharged through their storm drain systems and currently requires implementation of structural and nonstructural best management practices to reduce non-point source pollution impacts. The LARWQCB also approved several regional TMDL plans requiring communities to reduce the discharge of trash, pathogens, metals, and other pollutants. The CSTF agreed to continue reviewing and commenting on storm water permits and TMDL plans that may significantly impact sediment quality in regional ports and harbors (CSTF 2009).

Ballona Wetlands Restoration

The ACOE and the city of Los Angeles have undertaken a project to restore the Ballona Wetlands in Marina Del Rey, which is one of the most valuable habitats for rare and endangered species now restricted to some of the few remaining wetlands in Southern California. A 1930s-era flood control channel successfully diverted upstream stormwater directly into Santa Monica Bay. While the channel helped protect residents and structures from floods, it also severely degraded the saltmarsh and in turn caused a loss of native habitat and an invasion of non-native exotic species. To help restore the

192 acres (77.7 hectares) of remaining wetland, the ACOE proposed a project that would replace the current system of gates with a new system that would restore tidal circulation and ebb and flow cyclical "flushing" to a 13.5-acre (5.5-hectare) section of the wetlands. The $1.25 million project, sponsored locally by the city of Los Angeles, would provide greater opportunity to increase the habitat's biological productivity (ACOE 2005).

Beach Improvements/Capital Projects

The mission of the Los Angeles County Department of Beaches and Harbors (LACDBH) is to maintain the beaches and Marina Del Rey for the recreation of the citizens of Los Angeles County. The LACDBH is pursuing six projects, currently under construction, to improve public access, safety, and enjoyment of the County's beaches. The project locations include Dan Blocker Beach in Malibu, Dockweiler State Beach and Youth Center in Playa del Rey, Venice Beach in Venice, and Will Rogers State Beach in Pacific Palisades (LACDBH 2009).

Clearwater Port LNG Project

In March of 2006, when the Notice of Preparation for the El Segundo Marine Terminal was released, Clearwater Port Limited Liability Company (a subsidiary of NorthernStar Natural Gas Inc.) was proposing to construct Clearwater Port, an offshore, liquefied natural gas (LNG) receiving terminal and regasification facility located in Federal waters approximately 10.5 miles (16.9 km) offshore of Ventura County, California, in Federal Outer Continental Shelf Lease Block OCS-P 0217. In March 2010, the CSLC officially terminated the Clearwater Port LNG Project application after determining that Clearwater Port had abandoned its application due to inactivity.

Port of Los Angeles/Port of Long Beach

The POLA/POLB continues to expand to accommodate growth in marine shipping. The most current and relevant project is the recently approved POLA Pacific Energy Crude Oil Marine Terminal and Pipelines Project on Pier 400. The primary purpose of the Pacific Energy Pier 400 Project is to provide a deep-water berth that can efficiently accommodate the large 375,000-deadweight-(metric) tons deep-draft vessels that are becoming more common in the world's oil transport fleet. Consistent with this primary purpose is providing a modern terminal to provide the efficient, high-volume transfer of crude oil and intermediate petroleum products through a drain-dry pumping pipeline and storage system that would maximize the overall crude handling efficiency and capacity of the terminal. This includes completing the related transfer and storage facilities

necessary to accommodate forecasted and planned increases in volume of crude oil and intermediate petroleum products shipped through the POLA.

In addition, the POLB has recently approved the environmental study, labor agreement, and permits for the Middle Harbor Redevelopment project, green-lighting a $750 million renovation to transform the POLB shipping terminals E and F into one terminal and add railroad tracks and environmental improvements. The new terminal will double the cargo-moving capacity of the two existing facilities while potentially cutting air pollution from operations. Construction on the project could begin by the end of 2010 and will take 10 years to complete. Construction will be phased, allowing cargo operations to continue at the two terminals, Long Beach Container Terminal and California United Terminals. A major feature of the project will be adding 12.3 miles (19.8 km) of railroad track, which will allow nearly one-third of all the cargo at Middle Harbor to be moved by train, taking trucks off the road. The project would create a single 345-acre (139.6-hectare) facility by merging the existing terminals and adding 51 acres (20.6 hectares) of land by filling in slips.